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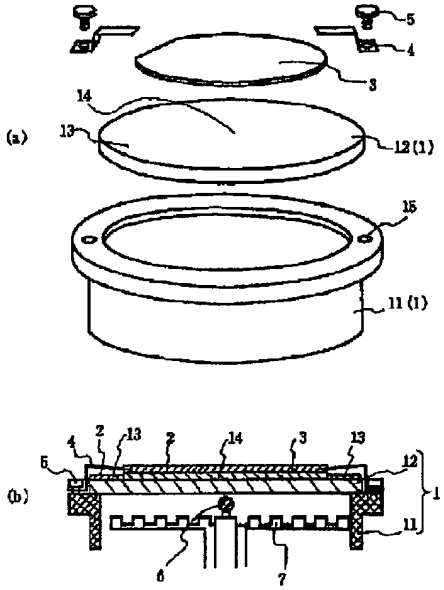
(54) **FORMATION METHOD FOR MERCURY CADMIUM TELLURIUM THIN FILM BASED ON MOLECULAR BEAM AND SUBSTRATE HOLDER THEREOF**

(57) Abstract:

PURPOSE: To prevent temperature drop caused by changes in substrate temperature during the growth of an HgCdTe thin film and enhance crystal properties by loading the substrate on the surface of a susceptor formed with a carbonic raw material of a substrate holder and forming the HgCdTe film.

CONSTITUTION: The surface of a susceptor 12 of a substrate holder 1 is formed with a carbonic raw material having a high thermal emissivity. A substrate 3 is loaded on the surface of the susceptor 12. A mercury cadmium tellurium (HgCdTe) thin film is formed on the substrate 3 by a molecular epitaxial method (MBE). A thermocouple 6 is loaded near the susceptor in such a fashion that it may not come into contact with the surface of the susceptor 12 of the substrate holder 1 and the substrate holder 1 is rotated, thereby making an MBE growth. Therefore, thermal radiation diffusion takes place to a satisfactory extent which is equivalent to the HgCdTe thin film having a high thermal emissivity deposited on the substrate, which has lowered the temperature in the substrate and produced a stabilized state already.



PN - JP6177038 A 19940624
PD - 1994-06-24
PR - JP19920329049 19921209
OPD - 1992-12-09
TI - FORMATION METHOD FOR MERCURY CADMIUM TELLURIUM THIN FILM BASED ON MOLECULAR BEAM AND SUBSTRATE HOLDER THEREOF
IN - SASAKI NARIHITO
PA - NIPPON ELECTRIC CO
IC - H01L21/203 ; C30B23/08 ; C30B29/48
CT - JP4026586 A [ ]; JP2233585 A [ ]; JP2271998 A [ ]; JP63284827 A [ ]; JP2287128 A [ ]

TI - Prodn of mercury cadmium telluride thin film - includes placing substrate board on susceptor of board holder, subjecting to molecular beam epitaxy, the susceptor surface comprising graphite material
PR - JP19920329049 19921209
PN - JP6177038 A 19940624 DW199430 H01L21/203 008pp
PA - (NIDE) NEC CORP
IC - C30B23/08 ;C30B29/48 ;H01L21/203
AB - J06177038 In a prodn. of Hg Cd Te thin film by molecular beam epitaxy by placing a substrate board on a susceptor of a substrate board holder, and then subjecting to the molecular beam epitaxy the surface of the susceptor is composed of graphite material.
- The substrate board holder is pref. rotatable to equalise temp. distribution of the substrate board. The substrate holder (1) has a susceptor (12) coated with an SiC layer, and a Mo-made cylindrical body (11) supporting the susceptor (12). The substrate board (3) is placed on the centre part (14) of the susceptor (12).
- USE/ADVANTAGE - Lowering of temp. of the substrate board growth of the Hg Cd Te thin film during the molecular beam epitaxy is effectively prevented, and the obtd. thin film has an improved crystallinity. The obtd. thin film is used for an Hg Cd Te IR ray detector etc.
- (Dwg.1/10)
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AN - 1994-243957 [30]

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PD - 1994-06-24
AP - JP19920329049 19921209
IN - SASAKI NARIHITO
PA - NEC CORP
TI - FORMATION METHOD FOR MERCURY CADMIUM TELLURIUM THIN FILM BASED ON MOLECULAR BEAM AND SUBSTRATE HOLDER THEREOF
AB - PURPOSE:To prevent temperature drop caused by changes in substrate temperature during the growth of an HgCdTe thin film and enhance crystal properties by loading the substrate on the surface of a susceptor formed with a carbonic raw material of a substrate holder and forming the HgCdTe film.
- CONSTITUTION:The surface of a susceptor 12 of a substrate holder 1 is formed with a carbonic raw material having a high thermal emissivity. A substrate 3 is loaded on the surface of the susceptor 12. A mercury cadmium tellurium (HgCdTe) thin film is formed on the substrate 3 by a molecular epitaxial method (MBE). A thermocouple 6 is loaded near the susceptor in such a fashion that it may not come into contact with the surface of the susceptor 12 of the substrate holder 1 and the substrate holder 1 is rotated, thereby making an MBE growth. Therefore, thermal radiation diffusion takes place to a satisfactory extent which is equivalent to the HgCdTe thin film having a high thermal emissivity deposited on the substrate, which has lowered the temperature in the substrate and produced a stabilized state already.
I - H01L21/203 ;C30B23/08 ;C30B29/48

PN - JP7014767 A 19950117
PD - 1995-01-17
PR - JP19930152041 19930623
OPD - 1993-06-23
TI - METHOD FOR GROWING CDTE ON SI SUBSTRATE BY MBE
IN - KAWANO MASAYA
PA - NIPPON ELECTRIC CO
IC - H01L21/203 ; H01L21/20

TI - MBE method for cadmium telluride layer growth on silicon substrate - involving cleaning substrate surface by hot air in hot changer and then providing epitaxial growth of cadmium telluride
PR - JP19930152041 19930623
PN - JP7014767 A 19950117 DW199512 H01L21/203 003pp
PA - (NIDE) NEC CORP
IC - H01L21/20 ;H01L21/203
AB - J07014767 The method involves cleaning the substrate (1) initially and then introducing it into growth apparatus. The substrate is heated at about 850deg. in heating chamber and the surface protection oxide film is removed.
- The substrate is then washed and a CdTe layer is grown by applying CdTe molecular beam. The CdTe epimer layer is grown by heating the substrate with the molecular beam at various temperature.
- ADVANTAGE - Forms good crystalline CdTe epimer layer and stabilises it.
- (Dwg.1/2)
OPD - 1993-06-23
AN - 1995-086762 [07]

PN - JP7014767 A 19950117
PD - 1995-01-17
AP - JP19930152041 19930623
IN - KAWANO MASAYA
PA - NEC CORP
TI - METHOD FOR GROWING CdTe ON Si SUBSTRATE BY MBE
AB - PURPOSE:To provide a method for growing CdTe epitaxial layer stably on an Si substrate by MBE.
- CONSTITUTION:A Si (221) off substrate (3 deg. off in the direction [-1 -1 4]) is employed for growing CdTe. In the substrate, lattice irregularity becomes 0 in the direction normal to step 3 because of the lattice relaxation. The substrate is cleaned at first by RCA cleaning before it is introduced to a growth system. The substrate is heated up to about 850 deg.C in a preheat chamber where protective oxide is removed from the surface of the substrate before it is introduced into a growth chamber. Temperature of the substrate is set at a predetermined level in the growth chamber and a molecular beam of CdTe is projected to effect the growth. At first, CdTe is grown by 500Angstrom at 200 deg.C of substrate temperature and then it is annealed at 400 deg.C for 10min without irradiating the molecular beam before CdTe is grown again at 300 deg.C of substrate temperature thus obtaining a CdTe (112) off epitaxial layer 2. Half width of 220sec is obtained in X-ray diffraction. It is a very good value for CdTe/Si.
I - H01L21/203 ;H01L21/20